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ABSTRACT

As part of an effort to evaluate college effectiveness and ensure student academic achievement, St. Vincent's College, a small two-year health science college in Bridgeport, Connecticut, formed a task force to develop general education outcomes across the curriculum. The college's general education core curriculum consists of 25 credits, including classes in English composition, mathematics, psychology, sociology, ethics, religious studies, physical/biological sciences, and a humanities elective. The task force determined that students completing the core should possess basic communication, math, research, and critical thinking skills; an appreciation of the humanities and of society; a knowledge of scientific principles; and ethics and values. The task force then developed competencies for each of these outcomes using a modified DACUM process. Finally, through surveys and reviews of syllabi and exams, the task force determined that competency-based learning experiences were being provided across the curriculum at the college. Based on task force results, appropriate instruments could then be developed to measure outcomes. Two appended tables present the DACUM Matrix of Curriculum Outcomes developed by the task force and a list of outcomes and competencies across the curriculum, showing the nursing, radiography, and general education courses that teach each competency. (BCY)

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ED 421 184

Educational Outcomes and Competencies Across the Curriculum

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St. Vincent's College is a small two-year health science college in the Northeast. Because the College has a strong commitment to the quality and quantity of the educational experience of its students, it is obligated to evaluate its effectiveness and assure student academic achievement. The assessment process already in place required a more formal organized approach, especially in the general education component of the curriculum.

The philosophy of general education at St. Vincent's College is derived from the Educational Philosophy of the institution. Courses in general education expose the student to values inherent in a Judeo-Christian education. They support and facilitate the student's development of critical thinking, logical reasoning and sound decision making. Knowledge obtained from these courses serves as a foundation for the learner's life long education, development and intellectual inquisitiveness necessary for living in a complex modern society.

The general education curriculum is derived from the Institutional objectives and is comprised of a core curriculum related to physical and social sciences and the humanities. All degree students enrolled in the College are required to complete a 25 credit core. The following courses comprise the core curriculum:

English Composition	3 credits
College Mathematics	3 credits
General Psychology	3 credits
Introduction to Sociology	3 credits
Ethics	3 credits
Introduction to the Study of Religion	3 credits
Physical/biological sciences	4 credits
Humanities: restricted elective	3 credits
	25 credits

The restricted elective must be taken from the Humanities: Art, Communication, Foreign language, History, Literature, Philosophy, Music and Religious Studies.

A Task Force of the Curriculum Committee was appointed to develop general education outcomes. The general education courses are understood to be those which a student takes, in addition to the major courses, to obtain an introduction to essential aspects of our culture.

The goal of general education is to strengthen both the general skills and broad conceptual abilities that students need to function competently in day-to-day life. Today's students are expected not only to possess information age skills such as writing and problem solving, but to be able to apply these skills and knowledge in an interdependent, culturally diverse world. These skills are necessary for lifelong learning.

Students who successfully complete the General Education component at St. Vincent's College shall possess the following concepts, skills and knowledge:

Basic communication skills
Basic mathematical skills
Basic research skills
Critical thinking and problem solving skills
An appreciation for the humanities
An appreciation for society
A knowledge of scientific principles, and the natural or physical sciences
Ethics and values

Competencies for each of these outcomes were developed utilizing a modified DACUM (Table 1). The Task Force recognized the importance of general education as an integral component of health care education. The ability to communicate, problem solve and analyze is essential if graduates are to maintain employment and cope with a changing and expanding knowledge base.

To achieve a further integration of general education into the associate degree career programs the task force decided that the outcomes, based on the significant and unique contributions of general education, must be regarded as essential as the health care outcomes. Therefore integrated and complementary outcomes should be considered in both the general education and the career programs.

Through surveys, review of syllabi and tests and other methods the task force ascertained that competency based learning experiences are being provided across the curriculum, sufficient to ensure that each student at the college has the opportunity to achieve each competency (Table 2). The challenge was to develop means to demonstrate through quantitative and qualitative indicators that St. Vincent's College students do indeed attain the competencies.

Once specific competencies had been identified the appropriate measurement instrument(s) could be determined. Multiple measures consisting of externally and internally developed instruments ensure the accuracy and efficacy of data. St. Vincent's College gathers data by means of student, graduate and employer surveys, standardized tests such as the Academic Profile and Assess Tests, and various faculty projects designed to determine achievement and competencies in the classroom.

St. Vincent's College has completed the initial stages of just assessing the educational outcomes and competencies, and is now in the process of repeated assessment and evaluation, establishing feedback loops and reporting mechanisms. All of this data is summarized and utilized as the basis for action plans to revise academic policy, if necessary, to ensure student academic achievement.

Table 1
DACUM Matrix of Curriculum Outcomes

A St. Vincent's College student completing the general education requirements shall possess the following concepts, skills and knowledge:

A. Basic Communication Skills	B. Basic Mathematical Skills	C. Basic Research Skills	D. Critical Thinking and Problem Solving Skills	E. An appreciation for the humanities	F. An appreciation for society	G. A knowledge of scientific principles, and the natural or physical sciences.	H. Ethics and Values
A.1 Processes information through listening.	B.1 Utilize basic computational methods.	C.1 Access information resources.	D.1 Gather factual information and apply it to a given problem in a relevant, clear, and comprehensive manner.	E.1 Demonstrate awareness of the scope and variety of works in the arts and humanities.	F.1 Evaluate social structures and influences.	G.1 Demonstrate an understanding of scientific theories.	H.1 Examine, articulate, and apply own ethical views.
A.2 Convey ideas and information through speaking.	B.2 Interpret numerical data.	C.2 Integrate new and existing knowledge.	D.2 Analyze, summarize, and interpret a variety of reading materials.	E.2 Understand those works as expressions of individual and human values within an historical and social context.	F.2 Understand the developmental processes that shape the individual.	G.2 Evaluate societal issues from a natural science perspective.	H.2 Understand and apply core concepts, (e.g. rights, responsibilities, justice) to specific issues.
A.3 Interpret written communication.	B.3 Demonstrate measurement techniques.	C.3 Demonstrate scientific, cultural, and technical literacy.	D.3 Use the problem-solving process.	E.3 Respond critically to works in the arts and humanities.	F.3 Demonstrate a knowledge of cultural, social, religious, and linguistic differences.	G.3 Discern patterns and relationships of biophysical and sociocultural systems.	H.3 Analyze and reflect on the ethical dimensions of legal, social, and scientific issues.
A.4 Use standard English.	B.4 Generate visual representation of data.		D.4 Recognize and articulate the value assumptions made by self and others.	E.4 Articulate an informed personal reaction to works in the arts and humanities.	F.4 Recognize interdependence of the world community.	G.4 Adapt to technological changes.	H.4 Identify personal values and consciously employ them in ethical decision making.
A.5 Convey ideas and information through writing.	B.5 Recognize limitations of quantitative data.				F.5 Demonstrate civic responsibilities.	G.5 Recognize the value of natural and physical sciences.	
A.6 Participate effectively in groups with emphasis on listening, critical and reflective thinking, and responding.							

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Table 2
Outcomes and Competencies Across the Curriculum

Outcome: **BASIC COMMUNICATION SKILLS**

Demonstrate the ability to read, listen, and interpret and communicate through appropriate spoken or written forms of standard English

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- process information through listening	NUR 101 - 232: Completes process records of interactions with clients.	RAD 234: Utilizes appropriate communication skills with patients in all stages of the life cycle, co-workers and peers.	ENG 101: Uses active listening and summarizes class comments for group discussion. PSY 101: Demonstrates ability to read, comprehend and retain materials.
- convey ideas and information through speaking	NUR 112: Prepares and implements a teaching plan for a diabetic client.	RAD 234: Provides diagnostic services with related teaching in a structured health care setting.	ENG 101: Is a competent speaker in small discussion groups. PSY 101: Presents views which are informed, logical and organized. HIS 101: Describes the key events of the Civil Rights Movement using Standard English.

Outcome: **BASIC COMMUNICATION SKILLS** (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- interpret written communication	NUR 101-232: Reads, interprets, and implements medical and nursing orders.	RAD 102, 113, 224, 232, 234: Interprets radiologic orders in order to function as beginning technologists in the health care delivery system.	ENG 101: Demonstrates increased skill in reading and thinking. PSY 101: Integrates materials from resources for oral presentation.
- use standard English	NUR 232: Submits reaction papers related to experiences in ambulatory settings.	RAD 233: Explains the different special radiologic procedures performed in the radiology department.	ENG 101: Uses correct grammar, language, spelling and punctuation. PSY 101: Demonstrates appropriate use of standard English when writing article critiques.

Outcome: **BASIC COMMUNICATION SKILLS** (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- convey ideas and information through writing	NUR 231 and 232: Submits a formal paper discussing a nursing issue.	RAD233: Describes the effect of pathology on the radiographic image. Student activities include completion of Radiologic paper.	ENG 101: Completes a writing portfolio containing several short papers and a formal essay. PSY 101: Writes formal paper utilizing standard criteria.
- participate effectively in groups with emphasis on listening, critical and reflective thinking, and responding	NUR 232: Plans, develops and presents Nursing Grand Rounds as a group to faculty and peers.	RAD 234: Performs and/or assists with all radiographic and fluoroscopic examinations of the skeletal system, thoracic and abdominal cavities, gastrointestinal and urinary systems. Lab activities included role-play and simulations.	ENG 101: Participates cooperatively and effectively in group discussion. ENG 213: Becomes a more active participant and more effective leader in group discussions. PSY 101: Integrates materials from resources in oral presentations.

Outcome: **BASIC MATHEMATICAL SKILLS**

Demonstrate the ability to apply basic principles of mathematics to the understanding and interpretation of mathematical data and problems.

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- utilize basic computational methods	NUR 231: Computes nutritional intake for clients receiving parenteral hyperalimentation.	RAD 101: Utilizes math formulas including fractions and basic algebraic equations to manipulate exposure factors.	MAT 101: Performs operations with rational numbers, percents, signed numbers and ratio proportions.
- interpret numerical data	NUR 112-N232: Determines insulin dosage as indicated on a sliding scale based on blood glucose level.	RAD 233: Analyzes how to adjust technical factors utilizing math formulas to produce a quality pediatric radiograph.	MAT 101: Interprets data accurately from tables, graphs and charts.

Outcome: **BASIC MATHEMATICAL SKILLS** (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- demonstrate measurement techniques	NUR 101 - 232: Draws up appropriate dosage of parenteral medications.	RAD 102: Observes and assists with routine and simple radiographic and fluoroscopic examinations of the chest, abdomen & extremities. Measures the patient part and selects appropriate X-ray exposure factors.	MAT 101: Solves word problems involving linear equations. BIO 103: Documents observations of measurable phenomena.
- generate visual representation of data	NUR 101 - 232: Documents intake and output on client flow sheets and charts.	RAD 234: Performs or assists with CT Scan images of the head and body, and participates in imaging procedures in the areas of MRI, special procedures and the cardiac suite. The above areas are all computerized and generate visual data.	MAT 101: Uses and interprets the normal curve distribution to validate data.

Outcome: **BASIC MATHEMATICAL SKILLS** (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- recognize limitations of quantitative data	NUR 112 - 232: Interprets client lab values as part of client assessment.	RAD 101, 112, 223, 231, 233: Completes research radiologic technology papers which require use of quantitative data.	MAT 101: Recognizes valid and invalid forms of argument.

Outcome: **BASIC RESEARCH SKILLS**

Demonstrate the ability to use basic research methods and apply current technologies to retrieve, evaluate, and use information.

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- access information resources	NUR 101 - 232: Utilizes library resources to obtain bibliographic citations.	RAD 101, 112, 223, 231, 233: Completes a radiologic technology paper and presents articles found in professional journals.	PSY 101: Demonstrates basic library research methods with required research paper.
- integrate new and existing knowledge	NUR 112 - 232: Incorporates recent clinical data obtained from current professional journals into nursing care plans.	RAD 101 - 234: Completes CAI and computer review assignments and Lab assignments including the use of a video disc to review and reinforce lessons.	PSY 112: Identifies elementary concepts and important research findings related to lifespan development.
- demonstrate scientific, cultural, and technical literacy	NUR 231 - 232: Utilizes on-line services to research material in the development of a formal nursing issues paper.	RAD 101 - 234: Performs on-line searches utilizing library resources in completing radiography assignments.	SOC 101: Presents tools of analysis of scientific study of society, including the ability to discern valid and reliable data from that which is not.

CRITICAL THINKING AND PROBLEM SOLVING SKILLS (Cont'd)

Outcome: **CRITICAL THINKING AND PROBLEM SOLVING SKILLS**

Think critically and make connections in learning across the disciplines.

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- gather factual information and apply it to a given problem in a relevant, clear, and comprehensive manner.	NUR 101 - 232: Collects and utilizes data from primary and secondary sources to establish a client's nursing diagnosis.	RAD 102, 113, 224, 232 and 234: Observes, assists and performs radiographic and fluoroscopic procedures on patients, varying techniques as needed due to patient condition(s).	PHI 204: Analyzes an issue before commenting, writing, or judging. ENG 213: Presents views which are informed, logical and organized.
- analyze, summarize and interpret a variety of reading materials.	NUR 231: Defines and discusses a nursing issue from the perspective of numerous authors in a formal paper.	RAD 101, 112, 223, 231, 233: Prepares and presents radiologic journal articles as a classroom activity.	SOC 101: Uses research and resources in the decision making process to gain insight into commonly accepted assumptions underlying familiar societal institutions and processes.
- use the problem-solving process	NUR 101 - 232: Collects client data, develops a nursing diagnosis, formulates client-centered goals, implements nursing assistive actions, evaluates planned outcomes, and institutes revisions.	RAD 102, 113, 224, 232, 234: Utilizes critical thinking/problem solving skills when confronted with unusual situations where you must deviate from the routine procedures.	MAT 101: Demonstrates critical thinking skills when solving equations and word problems. PHI 204: Uses research and resources in decision making processes.

CRITICAL THINKING AND PROBLEM SOLVING SKILLS (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- recognize and articulate the value assumptions made by self and others.	NUR 232: Identifies own value assumptions and those of others, related to a nursing issue in a formal paper.	RAD 102, 113, 224, 232 and 234: Recognizes/demonstrates accountability and responsibility for personal and professional behavior.	PHI 204: Learns to think critically and evaluate one's own ethical beliefs in terms of classical ethical principles and theories.

Outcome: **AN APPRECIATION FOR THE HUMANITIES**

Demonstrate knowledge of the human condition and human cultures, especially in relation to behaviors, ideas, and values expressed in works of human imagination and thought.

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- demonstrate awareness of the scope and variety of works in the arts and humanities	NUR 232: Develops a paper on an ethical issue in nursing.	RAD 233: Develops a paper on a social or ethical issue in medicine as it relates to radiology.	ENG 213: Discusses concepts and basic elements of communication.
- understand those works as expressions of individual and human values within an historical and social context	NUR 232: Demonstrates understanding of cultural diversity in a Nursing Grand Rounds presentation.	RAD 233: Demonstrates understanding of cultural diversity in class presentation of articles on social or ethical issues in medicine.	ENG 212: Demonstrates awareness of cultural and ethnic tradition which are reflective in writings. HIS 101: Discusses the social challenges of minorities, women, labor, and the poor.

Outcome: **AN APPRECIATION FOR THE HUMANITIES** (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- respond critically to works in the arts and humanities	NUR 232: Compares and contrasts the viewpoints of various authors in an ethical issues paper.	RAD 233: Compares and contrasts the viewpoints of various authors in a paper on a social or ethical issue.	HUM 101: Presents critique of readings related to theories of assimilation, pluralism and ethnic resurgence.
- articulate an informed personal reaction to works in the arts of humanities	NUR 232: Presents personal response to an ethical issue in a formal paper.	RAD 233: Presents articles on social or ethical issues in medicine.	ENG 214: Presents opinion of works by at least five American authors.

Outcome: **AN APPRECIATION FOR SOCIETY**

Demonstrate an awareness of self as an individual, as a member of a multicultural society and/or as a member of a world community a multicultural society and/or as a member of a world community

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- evaluate social structures and influences	NUR 101: Assesses the effects of a client's culture on self-care.	Rad 234: Utilizes appropriate communication skills with patients in all stages of the life cycle.	SOC 101: Demonstrates an awareness of the basic concepts and methods of Sociology. HIS 101: Examines social institutions and processes across a range of historical periods and cultures.
- understand the development processes that shape the individual	NUR 112: Utilizes various psychological theories to assess a child's growth and development.	RAD 233: Analyzes the adjustment of technical factors to produce a quality pediatric (vs adult) radiograph.	PSY 112: Demonstrates understanding of lifespan developmental processes and how they are influenced by cultural, social and cognitive styles. PSY 101: Discusses psychological phenomena, particularly those that impact everyday life.
- demonstrate a knowledge of cultural, social, religious, and linguistic differences	NUR 101 - 232: Develops individualized nursing care plans which reflect knowledge of a client's cultural, social, religious, and ethnic background.	RAD 233: Discusses the cultural differences as it relates to male vs female technologists performing mammography.	REL 101: Analyzes the social ramifications of religious thought. PSY 101: Illustrates the diversity found in the field of psychology with emphasis on cultural, gender, racial and ethnic issues.

Outcome: **AN APPRECIATION FOR SOCIETY** (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- recognize interdependence of the world community	NUR 232: Recognizes the cooperative and interdependent relationships of health care agencies in the planning of the continuity of client care.	RAD 102, 113, 224, 232, 234: Recognizes cooperative and interdependent relationships between healthcare professionals in the various clinical settings that radiographers perform their service.	SOC 101: Discusses the functioning of society and how its institutions affect and are affected by individuals and culture. PSY 101: Increases understanding of the changing world.
- demonstrate civic responsibility	NUR 232: Identifies own responsibility as a citizen and a professional to maintain licensure and currency in practice.	RAD 233 & 234: Identifies own responsibility as a citizen and a professional by completing 12 hours of continuing education annually as a requirement of maintaining ARRT certification.	HUM 101: Discusses individual responsibility related to current events and social issues.

Outcome: **A KNOWLEDGE OF SCIENTIFIC PRINCIPLES, AND THE NATURAL OR PHYSICAL SCIENCES**

Understand how and where the sciences are applied, including their application to environmental problems.

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- demonstrate an understanding of scientific theories	NUR 112: Assesses the presence of factors in a client which contribute theoretically, to the development of atherosclerosis.	RAD 112: Identifies the components of the X-ray machine and describes the electrical circuitry.	MAT 101: Applies scientific method to solve problems. PSY 101: Uses the scientific method to explain theory and a wide variety of experimentation.
- evaluate societal issues from a natural science perspective	NUR 231: Identifies the effects of air pollution on a client's respiratory status.	RAD 231: Evaluates the design of radiographic imaging facilities, ensuring that the public as well as staff is protected from ionizing radiation.	SOC 101: Questions evidence presented and makes informed judgements about societal issues.
- discern patterns and relationships of biophysical and sociocultural systems	NUR 101: Identifies a client's response to pain as a result of cultural influences.	RAD 113: Demonstrates appropriate procedures for handling patients with various medical needs.	BIO 113: Discusses the utilization of microbes for practical purposes to benefit humans and society.

Outcome: **A KNOWLEDGE OF SCIENTIFIC PRINCIPLES, AND THE NATURAL OR PHYSICAL SCIENCES** (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- adapt to technological changes	NUR 101 - 232: Maintains currency in technical and technological skills.	RAD 233 & 234: Maintains currency of technological changes by completing 12 hours of continuing education as a requirement of maintaining ARRT Certification.	PSY 101: Completes research paper utilizing the latest research methods including computer searches and use of compact disk storage units.
- recognize the value of natural and physical sciences	NUR 101 - 232: Identifies the usefulness of knowledge of human anatomy when selecting injection sites.	RAD 101 - 234: Applies knowledge of human anatomy to radiographic positioning skills.	SOC 101: Discusses the impact of science on society. BIO 103 - 104: Improves understanding of scientific principles and the methods of scientific inquiry.

Outcome: **ETHICS AND VALUES**

Identify, discuss, and reflect upon the ethical dimensions of political, social and personal life and understand the ways in which to exercise responsible and productive citizenship.

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- examine, articulate, and apply own ethical views	NUR 232: Delineates own response to an ethical issue in nursing in a formal paper.	RAD 101: Identifies principles relating to the legal and ethical aspects of radiography and expresses own view on ethical issues during discussion.	PHI 204: Critically evaluates one's own ethical beliefs in the light of reason. REL 101: Analyzes the ethical dimensions and social ramification of religious thought, belief and practice(s).
- understand and apply core concepts, (e.g. rights, responsibilities, justice) to specific issues	NUR 123: Identifies the rights of mentally ill clients who are hospitalized on an involuntary basis.	RAD 101 - 234: Recognizes the patients right to be fully informed regarding testing and the right to refuse radiographic examinations.	PHI 204: Discusses rights and responsibilities. PSY 101: Discusses the ethical practice of psychology as applied to experimentation.

Outcome: **ETHICS AND VALUES** (Cont'd)

COMPETENCY	NURSING	RADIOGRAPHY	GENERAL EDUCATION
- analyze and reflect on the ethical dimensions of legal, social, and scientific issues	NUR 231: Discusses the legal, ethical, social, and scientific aspects of clients who are HIV positive.	RAD 101: Identifies and discusses the Code of Ethics of the ASRT and ARRT as it relates to the practice of radiography.	PHI 204: Increases understanding by analyzing ethical and moral issues.
- identify personal values and consciously employ them in ethical decision making	NUR 232: Identifies the effects of personal values on a client's request for a DNR order as presented in Nursing Grand Rounds.	RAD 101: Identifies own personal values as well as the professional standards in discussions of legal/ethical case studies.	PHI 204: Describe what constitutes ethical behavior and identify own personal and professional ethical standards. SOC 101: Gains insight into assumptions underlying societal institutions and processes.

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